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for SUPERVISORS

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JUL 1 9 1963

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from the Director of Personnel

U. S. DEPARTMENT OF AGRICULTURE

HOW TO ANALYZE PROBLEMS AND MAKE SOUND DECISIONS

NOTE TO SUPERVISORS:

Do you sometimes feel as if the only thing you do from morning till night is wrestle with problems and make difficult decisions? And do you ever in a quiet, secret moment admit to yourself that maybe the way you handle such matters is a bit short of perfect? You are not alone. Successful problem analysis and decision making is a difficult task. But it can be mastered and changed from drudgery into one of the most exciting, rewarding parts of life. And the supervisor who has mastered this critical part of his job is constantly in demand by top management.

In recent months many Department employees have taken a rigorous but stimulating five-day course in Management Problem Analysis and Decision Making developed by Kepner-Tregoe & Associates of Princeton, N.J. This has been presented to thousands of government and business management men across the country. The results have been so good that "Tips" here presents a synopsis of some basic elements of sound problem analysis and decision making.

Carl B. Barnes
Director of Personnel
June 1963



Successful problem solving today demands an orderly, disciplined approach. As the diagram shows, you must follow a logical, systematic, step-by-step procedure which starts with the



identification of the problem, progresses to the determination of its cause and then goes on to the development of a solution which is safeguarded by sound control procedures.

This sounds complicated, but it is not. If you study the technique and consciously apply it every time you run up against a problem in the next few months, it will soon become second nature. And when that happens, you will find that you are a much better, more efficient, more productive supervisor.



STEP 1: IDENTIFY THE PROBLEM

A problem is the difference between what should be happening and what actually is happening. For instance, suppose you've decided that you should save \$100 a month. As long as you do, you have no problem. But if you find one month that you have saved only \$50, then you know something is wrong. You have a problem.

Most problems are as easy to see and identify as this. But many are not. Sometimes the onset of a problem is heralded merely by a vague, deep-down suspicion that things are not quite right. When you get that kind of

feeling, the only way to determine whether you really have a problem is to sit down and figure out what should be going on and what is actually going on. If the actual doesn't equal the should, the deviation is a problem.

STEP 2: SET PRIORITIES

Problems are not always single things. They often come in twos and threes. When that happens, you must rank them in the order of their importance and then tackle them one at a time. To do otherwise--to tackle them all at once--is only to confuse issues.

To determine the priorities of the situation, all you have to do is compare the problems and ask yourself which one must be solved first. Your answer will be based on the relative urgency of the problems, their relative seriousness, and their relative importance to the Department's operations. You should also take into consideration the amount of information available about the problems. Occasionally there is so little information about No. 1 problem that, in the interest of saving time, it is wise to tackle No. 2 first. (When you do this, you may uncover much of the information missing about No. 1.)

STEP 3: SPECIFY THE PROBLEM

Once you've identified the problems and decided which to work on, your next step is to spell out what the problem IS. You must determine what the specific nature of the problem is, when the problem occurs, where it occurs and its size. Of equal importance, you must determine what the problem IS NOT in order to clearly see the limits of your problem.

To illustrate, let's assume that you are a skilled amateur rose grower who is given the opportunity annually to test some of the new hybrids developed by the professionals. You have one large bed which is situated at the northwest end of your yard in front of a row of hemlocks you planted ten years ago along the western line of your property as a wind-break. Each spring you start off with 30 new test roses in the front half of the bed; 10 of

the previous year's test roses behind these; and, at the back of the bed, 20 old roses which you have kept for years for sentimental reasons.

Over the years you've been very successful with your roses. You rarely have more than three plants that you might call unsatisfactory--and these are most always new plants. Your old bushes are invariably strong and productive. But then last June, despite a normal fall and winter, you noticed that the old roses were not blooming as well as usual. Close examination of the plants, however, indicated nothing wrong with them. In fact, what little blackspot you had was on the newer roses. Bloom on the old plants had fallen off a little during the summer a year ago, but nothing like this.

Not knowing what to do about this strange situation, you did nothing. And nothing happened. As usual, the summer bloom on the new plants was spotty; on the old plants it became non-existent. Then, as you came into September and flowering increased, you were happy to discover that on the old plants it was about as good as it had ever been.

Fearing that you might have the same experience again next year, you sit down to figure out what's wrong. Here's the way you draw up the specification of the problem:

PROBLEM IS

WHAT Poor bloom, old roses

WHERE At back of bed

WHEN Spring and summer
A year ago in summer

SIZE 20 plants with poor bloom

PROBLEM IS NOT

Poor bloom, new roses
Poor foliage, disease, or any other complaint

In middle or front of bed

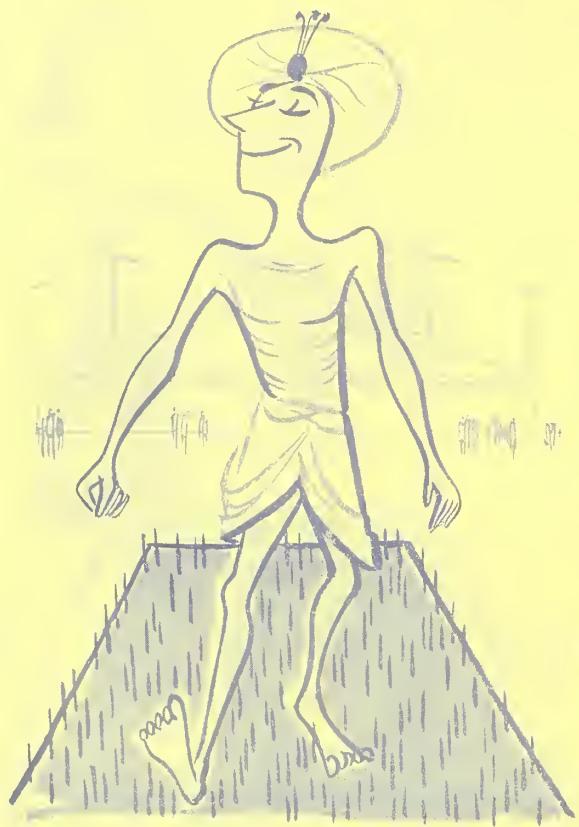
This Fall
Fall a year ago or any season before that

Just a few plants with poor bloom

This specification is the best statement you can make of the problem you will have to explain. It tells you what the problem is, where, when, and how big it is. It helps you draw the

limits of the trouble you will have to correct. Now you are ready to move on to finding what the cause is.





STEP 4: PINPOINT CHANGES THAT HAVE OCCURRED

Problems do not arise for no reason at all. They arise because something new, different and unplanned is introduced into a situation. In other words, the situation has changed.

It follows that when you start looking for what causes a problem, you are looking for a change. For example, if you examine the specifications of the rose-growing problem, one fact stands out: The old roses bloomed well a year ago; did poorly the following spring and summer; and then did well again. They do well sometimes and not at other times. But the new roses do about as well as you would expect. This clearly points up the fact that some change occurred in the situation for the old roses and not for the new.

Sometimes it's hard to see what has changed. Sometimes you can only find the crucial change that caused the problem by examining what is different between the IS and IS NOT elements of your problem specification.

For instance, you have the problem of poor bloom with the old roses but not with the new. What's different between the old and new? They are different varieties, for one thing. For another, they are located in different parts of the bed. Looking at the where specification, you find the old roses are located at the back of the bed.

What is different about the back of the bed as compared to the middle or front of the bed? Could there be a difference in the amount of sun they receive? Looking at the when of your specification, you find the poor bloom in summer and not in fall or any season prior to a year ago. What is different about summer and fall, about the past two summers as compared with the previous summers? Could growth and foliage of the hemlocks reduce the sun the old roses receive?

What was it? You don't know yet. But at least you're on the trail of an answer.

STEP 5: LIST POSSIBLE CAUSES OF THE PROBLEM

As you examine your problem, you inevitably say to yourself, "I wonder what caused this. Could it have been this? Or was it that?"

Don't just speculate idly, tossing off one possibility after another. Write your ideas down. Every one of them. And be sure to use your specification and your exploration of differences and changes to help you come up with ideas of cause you might otherwise overlook. Then, when you can't think of any more possibilities, move on to:

STEP 6: TEST THE POSSIBLE CAUSES

One mistake that many managers make in trying to solve problems is this: Having spotted what appears to be a likely cause of a problem, they immediately start building a case for it.

Nothing could be worse. It wastes time. It may waste the effort of a number of the manager's associates and subordinates. It may very well lead to a wrong answer.

Once you've developed a complete list of possible problem causes, you must systematically check each one of them out against the specification of the problem.

How do you do this? Simply ask yourself: "If this is the cause of my problem, then what would be the outcome? Does this square with the facts of the situation?"

For example, in the case of the rose bushes, if you put down "something wrong with the soil" as a possible cause of the poor bloom, a test against the facts would quickly show you were on the wrong track; for if the soil were to blame, then the fall bloom should have been no better than the spring bloom. But it was.

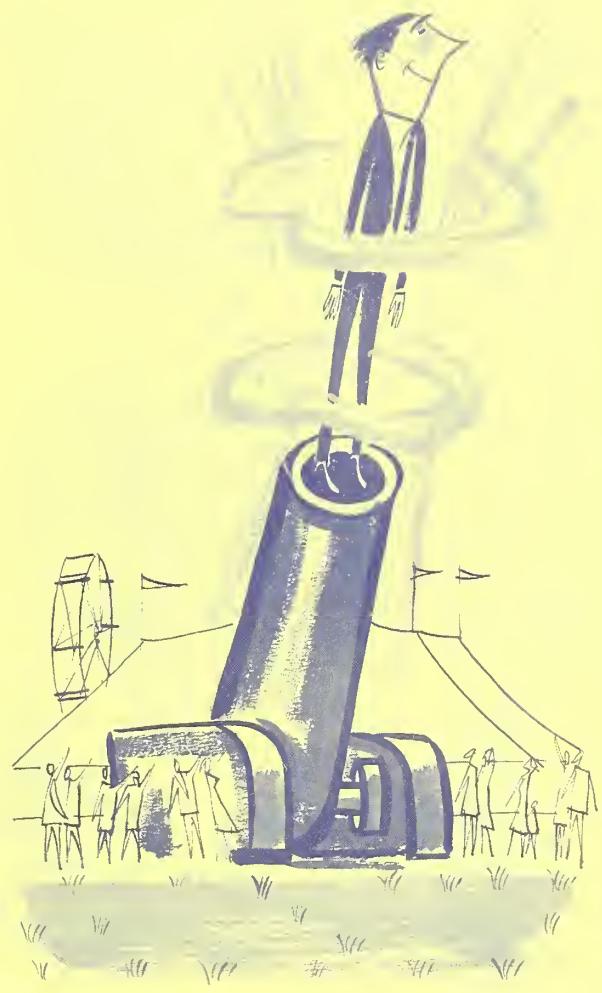
But if you then asked yourself, "Could there have been some change in the amount of sun that the old roses received?". Careful examination of the situation would show that this could indeed have caused the problem--and no doubt about it.

In other words, if a hypothesis does not produce a simple, logical, complete explanation of what actually happened, as stated in your problem specification, you can discard it as a problem cause. But if it does produce such an explanation, you know that you have zeroed in on the answer.

Or have you?

This you can't be sure of until you have tested all your hypotheses against the specification. Because if you find that several of them test out 100%, something is wrong. Either you have not specified your problem sharply enough, or you have overlooked some vital piece of information which must be entered in the specification.

There can be only one true cause of a problem, and until you find it, you can't correct the problem. In this case your examination proved that the difference in shade caused your problem.



WHERE DO YOU GO FROM HERE?

Now that you have determined the cause of your problem, you can do one of two things: Either you buck the matter topside, in which case it's up to you to present your superior with a clear explanation of the facts, or you proceed with the development and execution of a course of action which will bring actual back into line with should.

In most cases, as a supervisor, you will have the responsibility and authority to follow the second course. So now you start the climb up the decision-making side of the diagram on page 2.

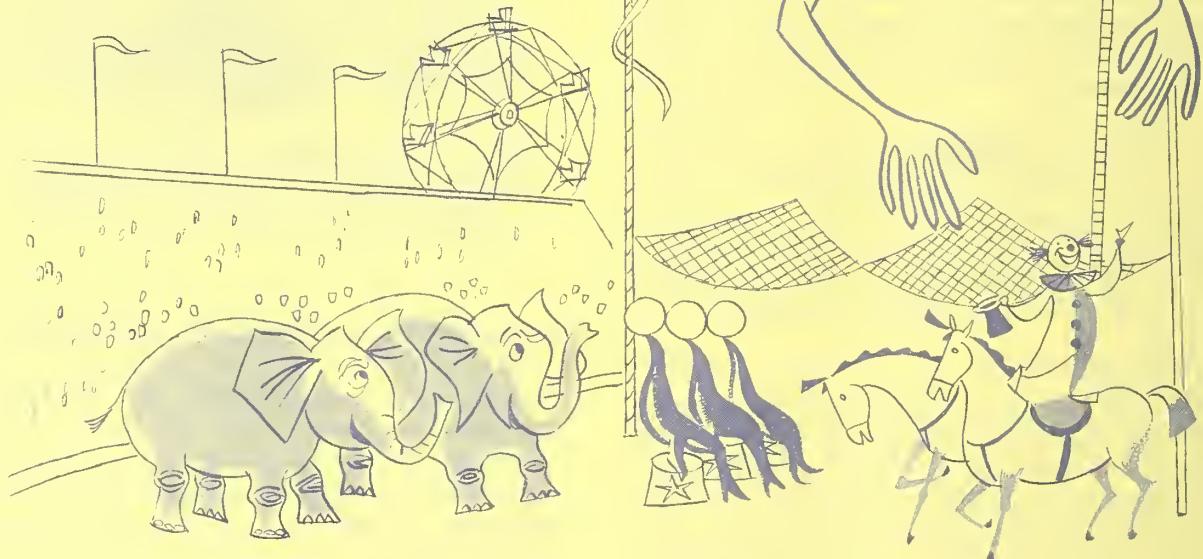
STEP 7: SET DOWN YOUR OBJECTIVES

First write down the things you must accomplish. Then put down the things you want to accomplish.

The musts, of course, are the more important; and any course of action you take should accomplish them all. But the wants are certainly desirable, and if they can be attained without sacrificing the musts, so much the better.

STEP 8: REVIEW YOUR RESOURCES

What is available to you in the way of manpower, money, time, facilities, etc., and what are the limitations on your use of them? This is a matter you must consider at length, because it has a bearing on your ability to do what you've set out to do. Inevitably you will find some resources are better than others, and this will affect the course you take.



STEP 9: DEVELOP ALTERNATIVE COURSES OF ACTION

Just as it is important to consider many possible problem causes, so it is essential to develop--not just one--but a number of different courses of action. The reasons are

obvious: You make best use of available information and resources. And you greatly improve your chances of coming up with a program of superlative merit.

Admittedly the job is demanding--tough on the lazy or impulsive manager or the one who is too rigid in his thinking to consider unusual ideas. But its importance cannot be over-emphasized.

STEP 10: EVALUATE ALTERNATIVES

It is a general rule that any problem can be corrected in several different ways. A corollary is that not all possible courses of action are equally good. Your job, then, after developing alternatives, is to compare them and see which is best.

There are three criteria to use. Ask yourself:

1. Will this course of action achieve my objectives? (What I must and want to accomplish?) Will it correct or change the condition which is causing my problem?
2. Is this course of action feasible? Can I do it with the resources I have available?
3. Will this course of action, if carried out, have any undesirable consequences?

STEP 11: REVIEW YOUR CHOICE

Evaluation of the alternative courses of action leads to selection of one of them. But before you commit yourself irrevocably to it, take a second look.

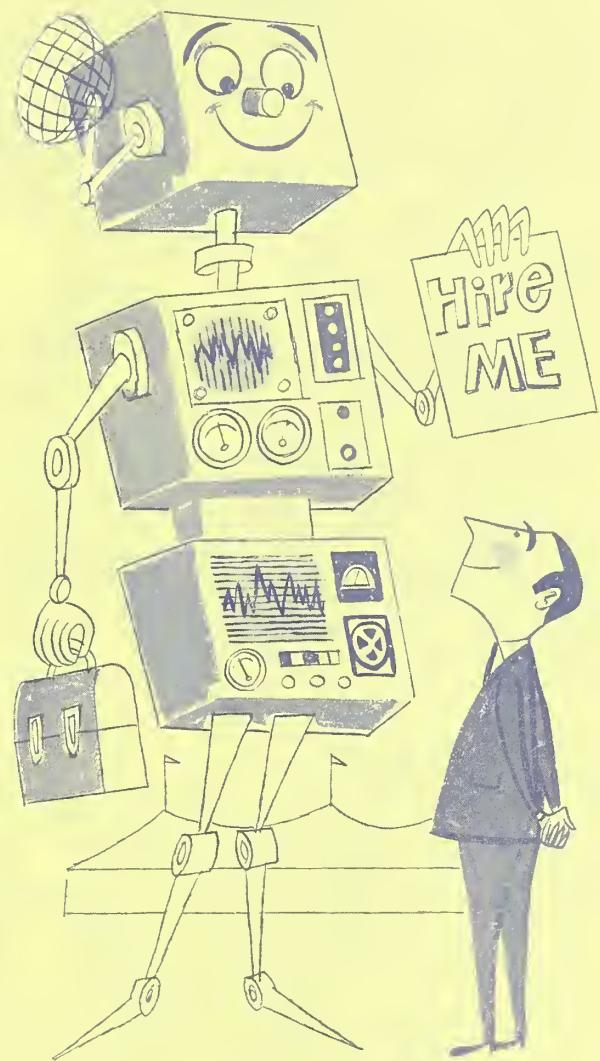
Make sure that it will accomplish your objectives.

Be certain that it is indeed feasible--that you really can carry through.

Above all, reconsider the consequences.

One of man's all-too-common failings is that he doesn't scout ahead. In his eagerness to do something--anything--he doesn't consciously look for all the possible results of his action. And many times these results are unpleasant--even disastrous.

Now at least you know what you're going to do. But wait just a minute. There is one more step you must take:



STEP 12: SET UP CONTROLS

If there is anything in management that can be predicted, it is that things will not work out exactly as planned or expected. Resources will turn out to be different, assumptions will be found invalid, flaws will show up in planning, elements of a plan will be miscommunicated, schedules will be garbled and the whole neatly laid-out scheme of action will be threatened with failure.

The only way to guard against these confusions, brushfires and crises is to look ahead and set up a series of control procedures which will warn you when corrective action is required.

Here are the four things you must do:

1. Anticipate what can go wrong and figure out what you can do to prevent it and what you will do if it does happen.

2. Set up a warning schedule. On a railroad there are semaphores which warn the locomotive engineer when he is approaching a danger point. You don't need visible signals. But you do need a carefully worked out timetable which tells you when, during the progress of your project, you are likely to run into trouble.

3. Determine what should have happened when you complete each phase of the program. Here you are setting up standards against which the actualities of the program can be compared. For instance, you may say to yourself, "On July first, Joe Smith must be in the field." Then, if it happens that on July 1st Joe is not

in the field, you know something has gone wrong.

4. Develop a system for receiving information about your program as it progresses. Decide who will be responsible for keeping an eye on things, when they should report back to you, and in what form you want their reports.

MISSION COMPLETED

Now, if you have taken the twelve steps essential to successful problem analysis and decision making, you should be back at the point on the diagram where actual equals should-- everything is normal.

It won't stay that way, unfortunately. The supervisor's life is a series of problems.

But remember this: The more you practice this proven method of analyzing problems and making sound decisions, the easier each succeeding new problem will seem.

